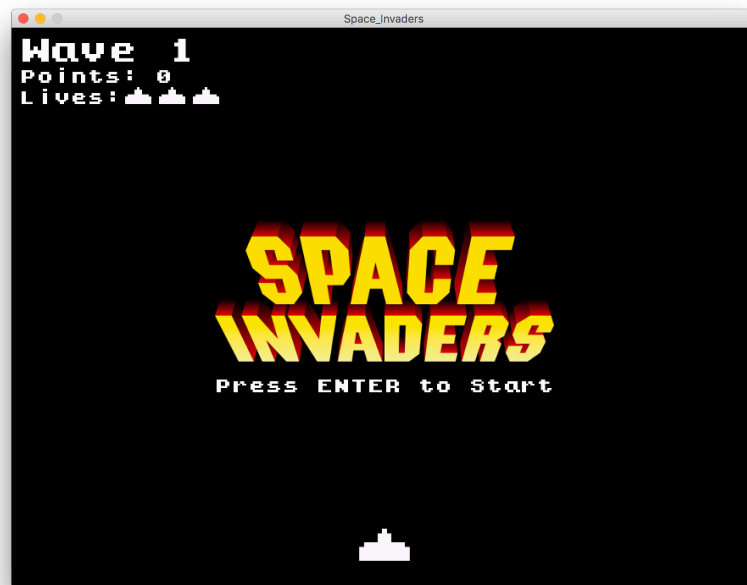


Jeff Lee
Space Invaders
June 2, 2016 - Spring Term
AP Computer Science III
Dr. Jadrian Miles

Project Walkthrough

Space Invaders opens with a title screen welcoming the user to the game, and prompting them to press enter to begin the first wave.



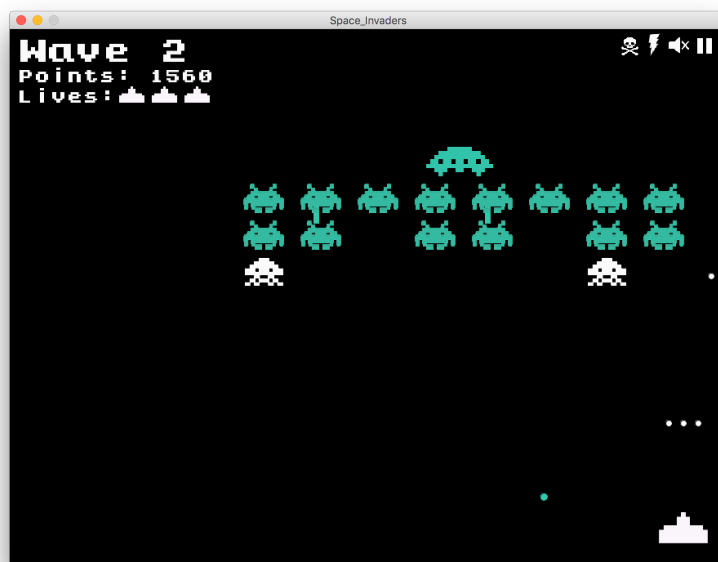
Once the first round begins, aliens start firing at the shooter randomly over split-second intervals. To play, the user must avoid the bullets dropped by aliens by using the left and right arrow keys. They also must use the space bar to shoot back and remove all the aliens from the screen to advance.



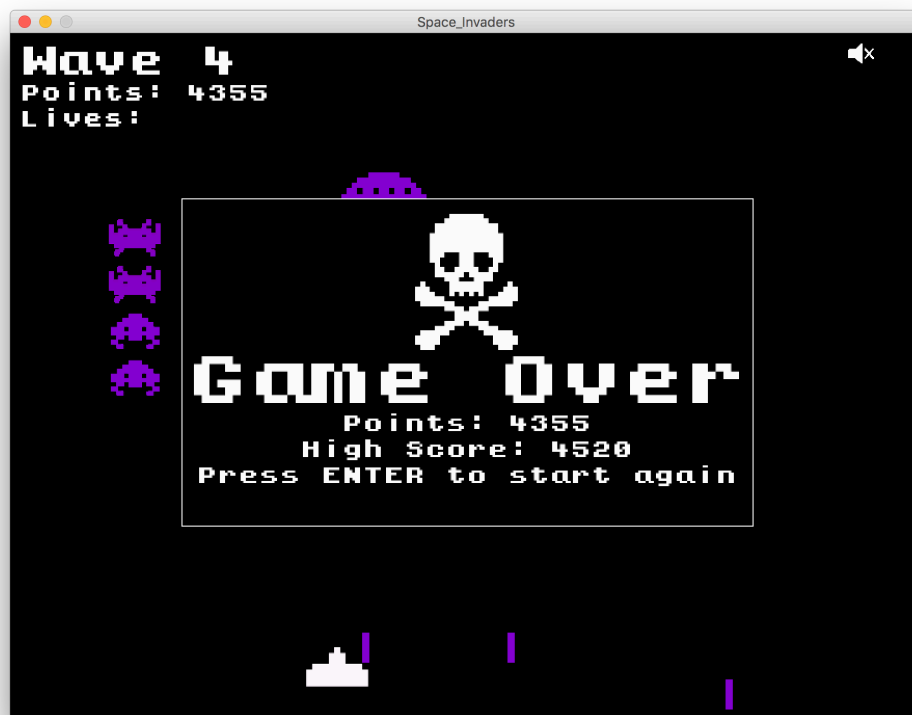
As you can see, different aliens have different actions. The base type simply move back and forth and shoot randomly. On top, however, is the Follow Alien, which lags behind the user dropping bullets in its path. This adds a challenge and keeps the user moving. On the bottom, the Defender Alien turns white after being hit once, and dies upon its second hit. On the screen, you can see that the program was paused to capture the picture. This can be done by pressing 'P'. Additionally, the lightning bolt power-up was dropped by a slain alien. If it is picked up by the user, the speed of the shooter will increase horizontally.



Once the wave is cleared, a message will display showing your accuracy, and you can view your remaining lives and score in the upper left as you can throughout the game. The points of each alien are different, ranging from 50-100 points depending on the type. Once the user presses enter, a newer, harder wave will begin.



As you can see, a new alien is introduced on the top row that shoots directly at the user, as indicated by a ball-shaped bullet. Additionally, if you look in the top right corner, you can see that mute, pause, and two power-ups are active. The skull power up indicates triple shot, and three bullets are shot in different directions to increase kill rates. Finally, when you run out of all of your lives, your score is displayed, and updated to be the high score if it is greater than the existing one.



Conceptual Description

From the start of this project, I was interested in coding a game that was fun to play and had a lot of depth to it. Space Invaders was one of the first that came to mind, as I had played it a lot when I was younger. A challenge I had to assess while creating this was to make sure it was not too simple. I faced this by first making the initial game with automated motion, and stemming from there. I had fun creating new features such as power-ups and smart aliens that follow and shoot at you. Additionally, I spent several days working on making graphics authentic and entertaining. I imported an 8-bit font, and spent time creating alternating graphics to give the aliens an animated effect. Finally, I realized that the game was much more fun when there was a static high score to beat. I researched on Processing forums and found out how to read and write a .txt file so that a high score would be saved even after the program was quit. I didn't consult many outside sources, though I spent a good amount of time playing the original game and reading about specific functions such as reading and writing on forums.

Project Reflection

The final project assignment was intentionally very broad, and I truly enjoyed spending my last few weeks in the class working on something I was passionate about. I found that I actually used all of the tools I had learned in the past months, something I can't say for many other classes, and truly enjoyed problem solving when things weren't working quite right. I have already decided to enroll in an engineering college next year, and the final project this term has helped sway me towards a major in computer science. While I know it won't all be as fun as game design, the primary element of solving small problems to work toward a big goal is very enjoyable to me, and I have found the past weeks very rewarding.

Acknowledgements

Sounds:

<http://soundbible.com/free-sound-effects-1.html>

Images:

<http://www.spaceinvadersslot.com/images/invader-animated-red.gif>

<http://thenewbiverse.com/wp-content/uploads/2014/10/space-invaders-logo-e1412894973856.png>

<http://www.softicons.com/game-icons/classic-games-icons-by-thvg/>

Code:

<https://forum.processing.org/one/topic/using-savestrings.html>

<https://forum.processing.org/two/discussion/2730/load-savestrings-not-working-when-exported>

<https://forum.processing.org/one/topic/how-to-perform-an-action-every-x-seconds-time-delays.html>

<http://www.openprocessing.org/sketch/114076>